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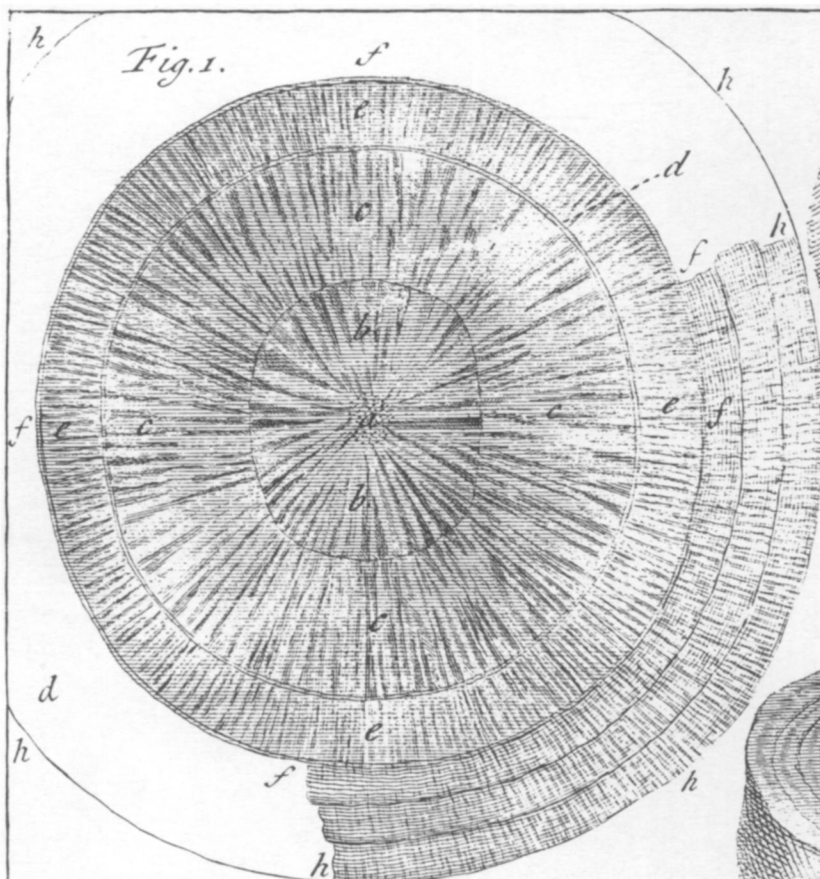


Fig. 4.

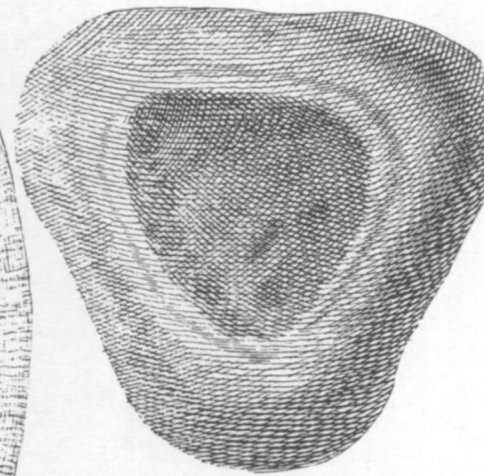


Fig. 5.



Fig. 2.

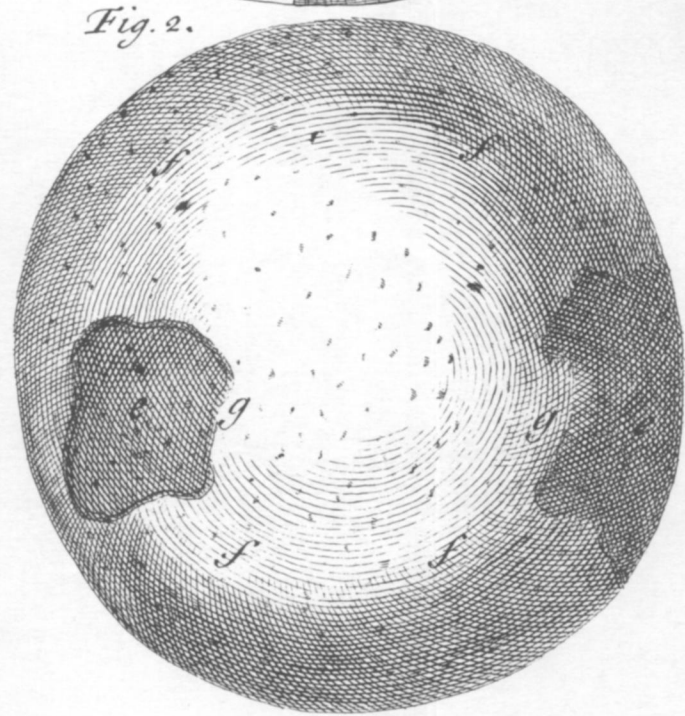


Fig. 3.

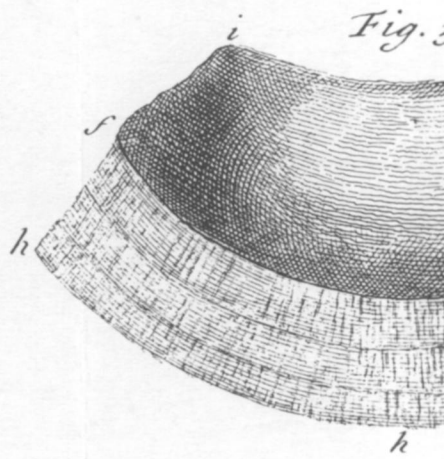


Fig. 7.

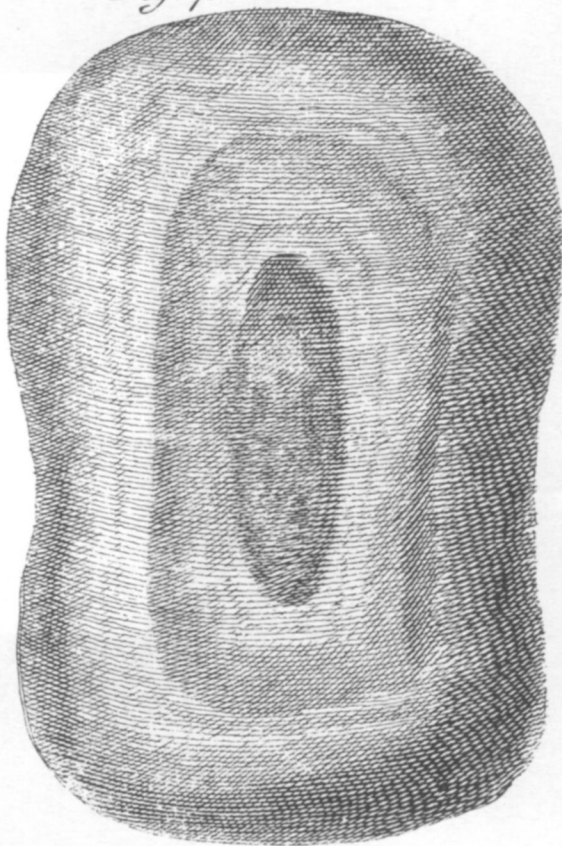


Fig. 9



Fig. 6.



Fig. 3.

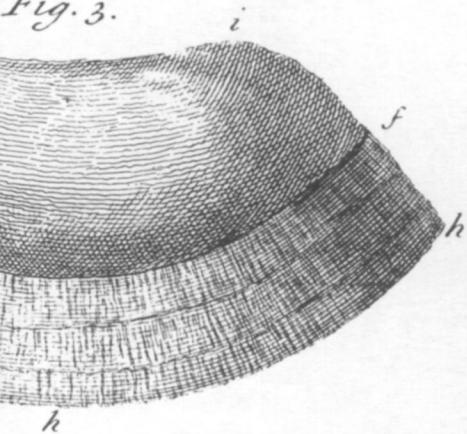
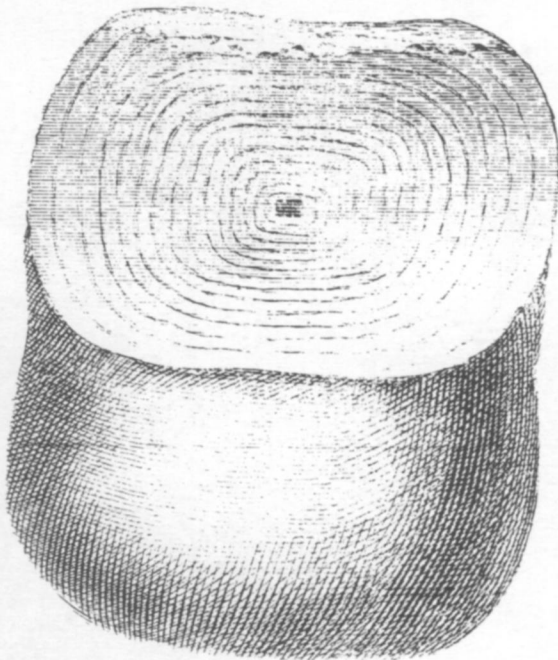


Fig. 8.



VII. *An Account of a very large Stone, found in the Colon of a Horse; and of several Stones, which were taken from the Intestines of a Mare; with some Experiments and Observations thereupon, by Edward Bailey, M.D. of Havant in Hampshire.*

Read Dec. 11. 1746. **T**HE Horse in which the large Stone

was found, belonged to a Miller in this Neighbourhood, and had been fed with Bran only for several Years. He was observed to be in Pain sometimes, but never so bad as to be hindered from his Work, till the Day of his Death; when he was taken on the Road with Symptoms of violent Pain, and wanted to lie down: However, the Carter drove him home; but, as soon as he had unharnessed him, the poor Creature was seized with a great Shaking, and dropp'd down dead immediately.

The Man who stripp'd him, observing a Swelling in his Belly, open'd it, and found in the *Colon* a very large Stone, but presently broke it in Pieces.

I did not hear of this Stone till the latter End of last Summer, when a Gentleman shew'd me a Fragment of it; which excited my Curiosity to go to the Mill where the Horse died, to inquire for the Remains. I found several Pieces of it, weighing in all one Pound six Ounces and an half *Troy* Weight. Some of them have been kept dry in the Mill, but the greatest Part laid abroad mixed with Rubbish; which, tho' exposed to the Weather above twelve Months,

Months, was not much altered, being only a little more brittle than the rest, and somewhat mouldered on the Outside.

About a Fortnight ago, another Piece of the same Stone was brought to me, weighing about eight Ounces *Troy*, containing near half the *Nucleus* and the innermost *Laminae* cohering together.

From all these Fragments, and the Description of the Stone given me by those who saw it, before it was broken in Pieces, it appears to have been of a spheroidal Figure, about 16 Inches in Circumference, consisting of a *Nucleus* and several *Laminae* or Shells involving one another; some of them are parted from each other, but the rest stick so close together, that they cannot be separated without breaking. All the *Laminae* are compos'd of transverse *Striae*, with their Points converging like Rays towards the Centre of the *Nucleus*. They are of a brown Colour, and shine like Resin. The *Nucleus* is of an oval Figure, and differs but little in its Composition from the rest of the Stone, having no other extraneous Matter in it but a few Pieces of Straw, and small Sticks, like the Twigs of a Broom; some of them appear intermixed with the *Striae* throughout the Body of the Stone. The external Surface of the Stone, and those *Laminae* that have been exposed to the Air, look of an Ash-Colour, are pretty even, but not very smooth, having many small Holes in them. See TAB. III. *Fig. 1, 2, 3.*

About the Beginning of last *July*, five large Stones were found lying near one another in the Intestines of a Mare, which belonged to a Carrier in this

Town, who had us'd her several Years in his Team. She was in good Case, and always appear'd to be sound and healthy; till one Morning, being at Grass, she was found lying on the Ground in a great Agony of Pain, with which she was continually tortured for about six Hours, without any Relief from various Remedies which were applied: At last she got up, and ran about the Field like a mad Creature, till she died.

I have seen but two of the Stones which were taken from her; one of a triangular Shape, the other oblong, a little depressed in the Middle, bearing some Resemblance to a Horse-Bean. (*See TAB. III. Fig. 4, 7.*) They are both similar in Substance, and seem to be of the Bezoar-Kind, being of a closer Texture than that above described, of an Olive-Colour, and finely polished.

The other three, as I am informed, were of the same Colour and Texture, and one of them larger than either of these, and of the Shape that at *Fig. 7.*

EXPERIMENTS.

These two Stones, being saw'd asunder, look'd like polished Marble; and were found to contain a Piece of an iron Nail in the Middle.

The triangular Stone weigh'd 75 Grains above $3\frac{1}{2}$ Ounces *Troy*. The other, being the larger, weigh'd but $2\frac{1}{2}$ Grains short of 16 Ounces *Troy* Weight.

A Fragment of the lesser Stone, which in the Air weigh'd Gr. $103\frac{6}{10}$, in Water weigh'd Gr. $42\frac{6}{10}$; so that

that this Stone is in specific Gravity to Water as 170 to 100.

A Fragment of the greater Stone, which weigh'd in Air Gr. $83\frac{7}{10}$; weigh'd in Water of the same Degree of Warmth, Gr. $34\frac{7}{10}$; so that the specific Gravity of this is the same as of the other.

A Quantity of the larger Stone, weighing four Ounces, being distill'd in a coated Retort, yielded Gr. $37\frac{7}{10}$ above 20 Ounces of a strong alkaline Spirit, of a brown Colour, such as is drawn from Hart's-horn; leaving a black Coal weighing Gr. $74\frac{1}{10}$ short of 2 Ounces; Gr. $36\frac{7}{10}$ being converted into Air, and otherwise lost in collecting the Produce of the Distillation; a small Quantity of black Oil adher'd to the Neck of the Receiver, and a few Drops of this Oil appear'd in the Spirit, when it was first pour'd off; but, after standing some time, fell to the Bottom in the Form of a black Sediment.

The black Coal, calcined under a Muffle in a very strong Fire, lost but 22 Grains, and became a white insipid Earth.

A Fragment of the great Stone, which had lain exposed to the Air and Weather above twelve Months, as mention'd above, weighing in the Air Gr. 58, weigh'd in Water Gr. $24\frac{4}{10}$, after it had stood a considerable Time, that the Water might enter its Cavities: So that this Stone, tho' seeming of a loose Texture, came out not much inferior to the other in specific Gravity; this being to Water as 165 to 100.

A

A Portion of this Stone, in a strong open Fire, lost in Calcination just half its Weight; becoming, as the former, a white insipid Earth; which, being infused in boiling Water, made no Alteration in its Colour, Taste, nor Smell.

Three Ounces of this Stone distill'd, produc'd Gr. $24\frac{1}{2}$ more than an Ounce and a Quarter of the like alkaline Spirit as the former yielded, and left a black Coal, weighing Gr. $16\frac{7}{10}$ above an Ounce and half.

From this chemical Analysis it appears, that these Stones are compounded chiefly of Earth, a large Quantity of volatile alkaline Salt and Water, some Oil, and a small Quantity of Air.

From hence it likewise appears, that the component Principles of these Stones bear a nearer Resemblance to those of Hartshorn than that of the *Calculus humanus*: For, according to Dr. Hales's Account, in his *Vegetable Statics*, Experiment N^o. 51. 241 Grains of Deer's Horn being distill'd left a *Calx* weighing Gr. 128; viz. above half its Weight; which shews that Horn contains much about the same Quantity of Earth as these Stones do: Whereas the *Calculus humanus*, when distill'd, affords but a small Quantity of Earth, Spirit, or Oil; the greatest Part of it being converted into Air.

Half an Ounce of the Stone (*Fig. 7. TAB. III.*) being powder'd and infused in four Ounces of boiling Water, made it smell strongly of Horse-Dung, and gave it a disagreeable Taste, while it was hot; but,

but, when the Infusion grew cold, it lost its Taste and Smell, and the Water, after standing some time, became, without being filtred, as pale and clear as before; nor did the Mixture of it with Oil of Tartar, Oil of Vitriol, nor *Aqua fortis*, produce any Alteration in it. This Experiment, being repeated several times, by infusing boiling Water on the same Powder, was attended with the same Effects, tho' near two Months pass'd between the first and last Infusions. The Powder, after the first Infusion, appear'd like Mud of two different Colours and Consistencies; the upper Part being softer, and of a lighter Colour, the under of a dark-brown, feeling hard like Sand. This Difference in the Colour and Texture of the Sediment remain'd in all the Infusions.

A small Piece of the same, and another of the biggest Stone, being let fall into boiling Water, sunk immediately, and continued at the Bottom, without rising at all, tho' the Water was kept boiling a considerable Time: Which shews, that these Stones are specifically heavier than the Stone found in the Stomach of a Horse, which Mr. *Watson* gives an Account of in the *Philos. Transf.* N°. 475. and also, that their constituent Principles are more firmly united together than those of that Stone; two Pieces of which, being let fall into Water almost boiling, immediately sunk, but rose again, and continued alternately rising and sinking a considerable time: And, as that Gentleman observes, the Powder of that Stone being infused in boiling Water, the Infusion,

fusion, when cold and filtered, was of a light-brown Colour; whereas the Colour of the Water was not changed in either of the above-mentioned Infusions; neither did any Ebullition ensue upon the Mixture of them with Oil of Tartar, Vitriol, &c.

I try'd to dissolve these Stones, by digesting small Pieces of them in the strongest acid and alkaline *Menstrua*, viz. Spirit of Salt, Sulphur, Oil of Vitriol, *Aqua fortis*, and capital Soap-Lees, &c. and at the same time try'd the Effects of those *Menstrua* on several Stones, which were given me by some of my Patients, who voided them. They were softened by some of them, but not totally dissolved by any, except the Oil of Vitriol and *Aqua fortis*: Nor did the *Aqua fortis* cause any Ebullition in dissolving them, as it did in the Solution of the *Calculus humanus*, which was attended with a brisk Ebullition, and hissing Noise, arising from the Eruption of the Air Bubbles from it: Which confirms what I observ'd above, that these Stones contain but a very small Quantity of Air, and that their saline and oily Particles are so closely combined with Earth, as not to be extracted without a strong Fire.

Havant, Nov. 27.
1746.

Explication

Explication of the Figures.

TABLE III.

The first three Figures exhibit three Views taken from several Parts of the great Stone found in the Horse.

Figure 1.

Represents a Fragment of it, containing Part of the *Nucleus* and the adjoining Shells or Incrustations.

a, The *Nucleus* or Center.

bb, The first Stone or Incrustation formed upon the *Nucleus*.

cccc, The second Incrustation, cover'd with a smooth Shell or Coat *dd*.

ee, The third Incrustation, which appears through the broken Shell of *Fig. 2*.

ffff, The smooth Shell or Coat of this Incrustation, which forms the Outside of *Fig. 2*.

hhhh, The fourth or outermost Incrustation, consisting of three Layers or Shells.

Fig. 2. Shews the external Surface of the third Incrustation.

ffff, The Shell almost intire, but broken off at *gg*.

ee, Part of the third Incrustation.

Fig. 3. Shews a Fragment consisting of Part of the three outermost Shells of the fourth Incrustation.

The Letters *ff* and *hh* answer to those of *Fig. 1* and *Fig. 2.* only the concave Part *fi, fi*, is what fitted and joined to the round Surface of *Fig. 2.*

The following Figures shew several Views of the two Stones found in the Mare.

Fig. 4. Represents the triangular Stone.

Fig. 5, 6. Represent the same sawn asunder, shewing the Divisions of the several Shells, with the *Nucleus* and the End of the iron Nail projecting from the Centre.

Fig. 7. Exhibits the larger Stone intire.

Fig. 8. Part of the same sawn off, representing the several Shells, with one Piece of the iron Nail in the Middle.

Fig. 9. The other Piece of the Nail that was sawn off.

N. B. One of the three Stones mentioned *p. 298.* is lately come to Hand; it measures round twelve Inches one Way, and eleven Inches another Way. This Stone, together with all the above-mention'd, and the several chemical Preparations produced from them, are repositied in the *Museum* of his Grace the Duke of *Richmond.*